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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/634,312
Filing Date: August 08, 2000
Appellant(s): KURIHARA ET AL.

Eric M. Parham (Reg. No. 45,747)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 20, 2005 appealing from the Office action mailed on July 11, 2005.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

NEW GROUND(S) OF REJECTION

Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa et al. (Yaganawa, USPN 6,667,790 B2) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128).

Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirakata et al. (Hirakata, Pub. No. US 2001/0051398 A1) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa, USPN

5,499,128) as applied to claims 1, 2, 5-12, 19 and 20 above and further in view of Yanawana et al. (Yanawana, USPN 6,667,790 B2).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128) as applied to claims 1, 2, 5-12, 19 and 20 above and further in view of Hirakata et al. (Hirakata, Pub. No. US 2001/0051398 A1).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 5,852,487	Fujimori et al.	12-1998
US 5,499,128 A	Hasegawa et al.	03-1996
US 6,667,790 B2	Yanagawa et al.	12-2003
US 6,331,881 B1	Hatano et al.	12-2001
US 2001/0051398 A1	Hirakata et al.	12-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5-12, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128).

Re claims 1, 10 and 12, as shown in Fig. 1, Fujimori discloses a touch sensor type liquid crystal display comprising:

a liquid crystal display panel 200a having first and second substrates 1, 2 arranged oppositely to each other by a specified gap (col. 7, lines 14-57 and col. 8, lines 42-47);

a plurality of columnar gap controlling spacers 11 formed of columnar shape for restricting a width of the gap and a spacer movement in a planar direction, wherein said gap controlling spacer is brought into surface-contact with one selected from the first and second substrates, the gap therebetween being restricted by the gap controlling spacer (col. 8, lines 58-64);

a touch sensor 200b added to the liquid crystal display panel including fixed and movable electrode plates 2 and 3 (col. 8, lines 8-27 and 42-47),

wherein, re claims 2 and 11, said gap controlling spacers 11 are regularly arranged in a planar direction of the liquid crystal display panel (col. 8, lines 62-64) and arranged in a black matrix region of the liquid crystal display panel (col. 20, lines 30-38).

Re claims 5-9, Fujimori further discloses a grid 14 arranged between the fixed and movable electrode plates,

wherein arranging positions of said gap controlling spacer and said grid are coincident with each other; and

wherein said movable and fixed electrode plates are made of plastic films (col. 8, lines 28-57).

Fujimori et al. discloses that the touch sensor type liquid crystal display is a color display (col. 20, lines 38-41) wherein the first and second substrates of the liquid crystal display panel are arranged oppositely to each other by interpolating a liquid crystal layer, said movable electrode plate 3 serves as a touch sensor arranged oppositely to the second substrate by a specified gap, and a conductive film 5a is provided to serve as a touch sensor formed on a surface of the second substrate which faces the movable electrode plate (col. 8, lines 8-13).

Fujimori discloses a touch sensor type liquid crystal display that is basically the same as that recited in claims 1, 5, 10 and 12 except for each of the spacers having two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces.

As shown in Figs. 12 and 13, Hasegawa discloses a liquid crystal display device comprising columnar spacer having two members 112d with one of the two members contacting a first substrate 111 and the other of the two members contacting a second substrate 141 and the two members contacting each other at a point intermediate between the first and second substrates,

wherein the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is no larger in area than either of the substrate contact surfaces (width L1) (col. 23, line 61 through col. 24, line 20);

wherein, re claim 19, each of the two members of each spacer is columnar in shape (col. 23, lines 61-65); and

wherein, re claim 20, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is smaller in area than either of the substrate contact surfaces (width L1) (col. 19, lines 47-57 and col. 24, lines 12-20).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the touch sensor type liquid crystal display of Fujimori with the teaching of Hasagawa by having the gap controlling spacers having two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces to permit suppressing the light leakage around the spacer and hence, achieve a good picture image display (col. 24, lines 21-24).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128) as applied to claims 1, 2, 5-12, 19 and 20 above and further in view of Hatano et al. (Hatano, USPN 6,331,881 B1).

The touch sensor type liquid crystal display of Fujimori et al. as modified in view of Kishimoto et al. above includes all that is recited in claim 3 except for arranging densities of said gap controlling spacers according to the number of times of touching the touch sensor.

As shown in Fig. 3, Hatano discloses a liquid crystal display comprising a plurality of gap controlling spacers (col. 6, lines 56-61) having different densities in regions B1-B4 to suppress change in display state which may caused by an externally applied pressure even if the plate is soft (col. 11, lines 1-7).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the touch sensor type liquid crystal display of Fujimori with the teaching of Hatano by arranging densities of the gap controlling spacers according to the number of times of touching the touch sensor to obtain a high self-holding property and suppress change in display state for improving viewing angle (col. 11, lines 1-10).

NEW GROUND(S) OF REJECTION

Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa et al. (Yaganawa, USPN 6,667,790 B2) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128).

Re claim 13, as shown in Figs. 24A and 24B, Yanagawa discloses a liquid crystal display comprising:

a liquid crystal display panel having first and second substrates 1A and 1B arranged oppositely to each other by a specified gap, and

gap controlling spacers 10, each of which restricts a width of the gap and a spacer movement in a planar direction (col. 11, lines 19-30),

wherein arranged densities of said gap controlling spacers are not uniform (Fig. 24A); and

wherein, re claims 14 and 18, an arranged density of said gap controlling spacers is high in a center of the liquid crystal display panel as shown in Fig. 24A (col. 11, lines 31-44);

wherein, re claim 17, said gap controlling spacers are regularly arranged in a planar direction of the liquid crystal panel as shown in Fig. 11(a).

Yanawana discloses a liquid crystal display that is basically the same as that recited in claim 13 except for each of the spacers having two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces.

As shown in Figs. 12 and 13, Hasegawa discloses a liquid crystal display device comprising gap controlling spacers, each of the spacers having two members 112d with one of the two members contacting a first substrate 111 and the other of the two members contacting a second substrate 141 and the two members contacting each other at a point intermediate between the first and second substrates,

wherein the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is no larger in area than either of the substrate contact surfaces (width L1) (col. 23, line 61 through col. 24, line 20);

wherein, re claim 15, each of the two members of each spacer is columnar in shape (col. 23, lines 61-65); and

wherein, re claim 16, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is smaller in area than either of the substrate contact surfaces (width L1) (col. 19, lines 47-57 and col. 24, lines 12-20).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the touch sensor type liquid crystal display of Yanawana with the teaching of Hasagawa by having the gap controlling spacers formed by two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces to permit suppressing the light leakage around the spacer and hence, achieve a good picture image display (col. 24, lines 21-24).

Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirakata et al. (Hirakata, Pub. No. US 2001/0051398 A1) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128).

Re claim 13, as shown in Fig. 18, Hirakata discloses a liquid crystal display comprising:

a liquid crystal display panel having first and second substrates 100 and 200 arranged oppositely to each other by a specified gap (paragraph 190), and

gap controlling spacers 220 (gap retaining member), each of which restricts a width of the gap and a spacer movement in a planar direction (paragraph 190),

wherein arranged densities of said gap controlling spacers are not uniform as shown in Fig. 21A (paragraph 201);

wherein, re claims 14 and 18, an arranged density of the gap controlling spacers 710 are arranged at a high density in a center of the liquid crystal display panel (as pixel confronting area 202) so as not to be formed in the driver-circuit confronting areas 203 and 204 as shown in Fig. 23 (paragraphs 234 and 235); and

wherein, re claim 17, as shown in Fig. 22, said gap controlling spacers are regularly arranged in a planar direction of the liquid crystal panel.

Hirakata discloses a liquid crystal display that is basically the same as that recited in claim 13 except for each of the spacers having two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces.

As shown in Figs. 12 and 13, Hasegawa discloses a liquid crystal display device comprising gap controlling spacers, each of the spacers having two members 112d with one of the two members contacting a first substrate 111 and the other of the two members contacting a second substrate 141 and the two members contacting each other at a point intermediate between the first and second substrates,

wherein the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is no larger in area than either of the substrate contact surfaces (width L1) (col. 23, line 61 through col. 24, line 20);

wherein, re claim 15, each of the two members of each spacer is columnar in shape (col. 23, lines 61-65); and

wherein, re claim 16, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point (width L2) is smaller in area than either of the substrate contact surfaces (width L1) (col. 19, lines 47-57 and col. 24, lines 12-20).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the touch sensor type liquid crystal display of Hirakata with the teaching of Hasagawa by having the gap controlling spacers formed by two members with one of the two members contacting the first substrate and the other of the two members contacting the second substrate and the two members contacting each other at a point intermediate between the first and second substrates, the cross-section of each spacer parallel to the plane of a substrate at said intermediate point being no larger in area than either of the substrate contact surfaces to permit

suppressing the light leakage around the spacer and hence, achieve a good picture image display (col. 24, lines 21-24).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa, USPN 5,499,128) as applied to claims 1, 2, 5-12, 19 and 20 above and further in view of Yanawana et al. (Yanawana, USPN 6,667,790 B2).

The touch sensor type liquid crystal display of Fujimori as modified in view of Hasegawa above includes all that is recited in claim 4 except for a high density of said gap controlling spacers in a center of the liquid crystal display panel.

As shown in Figs. 11A, 24A and 24B, Yanawana discloses a liquid crystal display wherein gap controlling spacers 10 are regularly arranged in a planar direction of the liquid crystal display panel and an arranged density of said gap controlling spacers is high in a center of the liquid crystal display panel (col. 11, lines 31-44).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the touch sensor type liquid crystal display of Fujimori with the teaching of Yanagawa by arranging a high density of said gap controlling spacers in a center of the liquid crystal display panel for maintaining the cell gap force in proportion to the size of the liquid crystal display panel, and hence providing a remarkable high contrast display (col. 1, lines 9-12 and 53-55 and col. 11, lines 31-40).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. (Fujimori, USPN 5,852,487) in view of Hasegawa et al. (Hasegawa,

USPN 5,499,128) as applied to claims 1, 2, 5-12, 19 and 20 above and further in view of Hirakata et al. (Hirakata, Pub. No. US 2001/0051398 A1).

The touch sensor type liquid crystal display of Fujimori as modified in view of Hasegawa above includes all that is recited in claim 4 except for a high density of said gap controlling spacers in a center of the liquid crystal display panel.

As shown in Fig. 23, Hirakata discloses a liquid crystal panel comprising gap controlling spacers 710, wherein an arranged density of said gap controlling spacers is high in a center of the liquid crystal display panel (pixel confronting area 202) since the gap controlling spacers are not formed in the driver-circuit confronting areas 203 and 204 (paragraphs 234 and 235).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the touch sensor type liquid crystal display of Fujimori with the teaching of Hirakata by arranging a high density of said gap controlling spacers in a center of the liquid crystal display panel so as to prevent stress exerted on the driver circuits, and hence to increase the yield of the driver circuits (paragraph 235).

(10) Response to Argument

Applicant's arguments filed December 20, 2005 have been fully considered but they are not persuasive.

Re claims 1, 2, 5-12, 19 and 20, Applicant argued that Fujimori in view of Hasegawa fails to teach or suggest "a cross section of each spacer parallel to the plane

of a substrate at said intermediate point is no larger than in area than either of said first and second contact surfaces as claimed in claims 1, 5, 10 and 12.

At first, Applicant argued that Fujimori is generally directed to a touch-sensing LCD with a mesh spacer and the disclosure of Fujimori with columnar spacers substituted for the mesh spacer in a touch sensor type LCD would be unworkable. The Examiner disagrees with Applicant's remarks since every patent is presumed valid and presumption includes the presumption of operability. Where Applicant asserts that the reference relied upon is inoperative, the claims represented by applicant must distinguish from the alleged inoperative reference disclosure (see MPEP 716.07).

Further, Applicant argued that Hasegawa may show columnar spacers with relatively thin mid-sections, there is no teaching or suggestion that both substrate contact surfaces have a contact area greater than the contact area between two members since according to Figs. 10 and 11, the contact surfaces have a recessed portion or void. Again, the Examiner disagrees with Applicant's remarks since Figs. 10-11 of Hasegawa's third modification were not used by the Examiner for the rejection; instead, Figs. 12-13 of Hasagawa's fourth modification have been used by the Examiner. Figs. 12-13 clearly show that the columnar spacer 112d has no void and the contact surface area is greater than the contact area between two members since the width L1 of the contact surface is greater than the width L2 of the contact area between two members. It is noted that if the cross section of the columnar spacer parallel to the substrate is circular (col. 21, lines 54-58), the widths L1 and L2 are considered as diameters and the areas would be (pi) x $L1^2$ /4 and (pi) x $L2^2$ /4 respectively. It is also

noted that although the resin and the developing agent used are similar, the columnar spacer in Figs. 10-11 is different with the columnar spacer in Figs. 12-13 since the spacer in Figs. 10-11 is formed by a different process such that a recessed portion at the contact surface area is created (col. 22, line 65 through col. 23, line 34 and col. 24, lines 4-20). Thus, Figs. 12-13 of Hasegawa does teach the contact area between the spacer members at the midsection being no greater than the contact area between each spacer member and its respective substrate and Hasegawa does cure the deficiency of Fujimori with respect to "cross-section of each spacer parallel to the plane of a substrate at said intermediate point is no larger in area than either of said and second contact surfaces."

Applicant also remarked that the Examiner has effectively ignored the fact that claim 1 recites a relationship between internal contact areas rather than any particular external shape. It is unclear what "internal contact areas" and "external shape" mean since these limitations are not found in the claims.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the showings of Fujimori with respect to the columnar spacers are designed or suggested for supporting

the loads of touch sensor usage and Hasegawa's reference is employed for teaching a columnar gap controlling spacer having two members contacting each other at a point intermediate between the first and second substrates, wherein the cross-section of the spacer parallel to the plane of a substrate at said intermediate point is no larger in area than either of the substrate contact surfaces of the two members so as to permit suppressing the light leakage around the spacer and achieve a good picture image quality. Thus, those of ordinary skill in the pertinent art for touch-sensor devices would adopt the teaching of Hasegawa to modify the touch sensor type liquid crystal device of Fujimori in order to permit suppressing the light leakage around the spacer and achieve a good picture image quality, which is a reasonable expectation of success. Accordingly, this reasonable expectation has been founded in the Hasegawa's reference, not in the Applicant's disclosure.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Furthermore, re claims 4 and 13-18, at the first time, Applicant argued that the JP 2000-227596 to Yanagawa is unavailable as a reference since it was first published on

August 15, 200 after Applicant's actual US filing date, which is August 8, 2000. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection as shown above.

Finally, re claim 3, Applicant argued that nowhere does Hatano disclose an LCD touch sensor, much less one than that is designed to be touched repeatedly. Again, the Examiner disagrees with Applicant's remarks. Although, Hatano does not disclose an LCD touch sensor, Hatano is employed for teaching a liquid crystal display comprising a plurality of gap controlling spacers (col. 6, lines 56-61) having different densities in regions B1-B4 in order to suppress change in display state which may caused by an externally applied pressure even if the plate is soft (col. 11, lines 1-7). Accordingly, the disclosure of Hatano is obviously applicable to the touch sensor type liquid crystal display of Fujimori by arranging densities of the gap controlling spacers according to the number of times of touching the touch sensor (or external applied pressure) in order to obtain a high self-holding property and suppress change in display state for improving viewing angle for the display (col. 11, lines 1-10).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer

exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

Thoi V. Duong 

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

Janice A. Falcone

Janice A. Falcone

Conferees:

Dave Porta, SPE AU 2884 _____ Date 03/02/06

Drew Dunn, SPE AU 2872 _____ Date 3/3/06

Thoi Duong, Examiner AU 2871 _____ Date 02/28/06